4/3/2019

Keystone Rustproofing, Inc. Process Flows

Process Lines New Lines	Discharge Rate Gal. Per Week	Discharge Rate Gal. Per Day Based on a 5-day week			Cyanide and Silver Bearing
1. Anodize	8,000	1,600	Metal Finishing	PSNS	N/A
2. Dull Tin/Cad	3,000	600	Metal Finishing	PSNS	Cyanide
3. Silver/Tin/Electroless Nickel on Alum	15,000	3,000	Metal Finishing	PSNS	Cyanide & Silver
4. Large Bright Tin	5,000	1,000	Metal Finishing	PSNS	N/A
Old Lines					
1. Alkaline Barrel Zinc	25,000	5,000	Electroplating	PSES	N/A
2. Alkaline Rack Zinc	18,000	3,600	Electroplating	PSES	N/A
3. Phosphate	1,500	300	Electroplating	PSES	N/A
4. Passivate	3,500	700	Electroplating	PSES	N/A
5. Rack Silver Line	6,000	1,200	Electroplating	PSES	Cyanide & Silver
6. Barrel Nickel	8,000	1,600	Electroplating	PSES	N/A
7. Alodine	4,000	800	Electroplating	PSES	N/A
8. Selective Tin	1,500	300	Electroplating	PSES	N/A
9. Copper, Nickel, Chrome	7,200	1,440	Electroplating	PSES	Cyanide & Silver
Total Discharge	105,700	21,140			

Wastestream	Daily Flow	
Rack Silver	1,200	
Copper, Nickel, Chrome	1,440	Total cyanide bearing wastestreams regulated under Electroplating
	2,640	
Dull Tin/ Cad	600	
Silver/Tin/Electroless Nickel on Alum	3,000	
	3,600	Total cyanide bearing wastestreams under Metal Finishing

Parameter	40 CFR 413.24(B) Daily Maximum Pretreatment Standards for Existing Sources Electroplating Subcategory	40 CFR 413.24(B) Average of Daily Values for 4 consecutive monitoring days	40 CFR 413.04 Standards for Integrated Facilities Equivalent 30-day average	40 CFR 433.17(a) Daily Maximum Pretreatment Metal Finishing New Sources Metal Finishing Subcategory	40 CFR 433.17(a) Monthly Average Pretreatment Standards for New Sources Metal Finishing Subcategory
Silver	1.2	0.7	0.5	0.43	0.24
Total Cyanide	1.9	1	0.55	1.2	0.65
Copper	4.5	2.7	1.8	3.38	2.07
Nickel	4.1	2.6	1.8	3.98	2.38
Chromium	7.0	4	2.5	2.77	1.71
Zinc	4.2	2.6	1.8	2.61	1.48
Lead	0.6	0.4	0.3	0.69	0.43
Cadmium	1.2	0.7	0.5	0.11	0.07
pH	7.5-10.0	-	-	-	-
Total Toxic Organics	2.13	-	-	2.13	-
Total Metals	10.5	6.8	5	-	-

New Process Lines

Wastewater associated with new process lines referred to as Anodize, Dull Tin/Cad, Silver/Tin Electroless Nickel on Alum and Large Bright Tin
are regulated under PSNS standards for Metal Finishing under 40 CFR 433.17(a)
These wastestreams total 6,200 gallons per day
Anodize 1,600 +Dull Tin/Cad 600 gpd + Silver/Tin/Electoless Nickel on Alum 3,000 gpd + Large Bright Tin 1,000 gpd = 6,200 gpd

Old Process Lines

Wastewater Associated with old process lines referred to Alkaline Barrel Zinc, Alkaline Rack Zinc, Phosphate, Passivate, Rack Silver Line,
Barrel Nickel, Alodine, Selective Tin and Copper/Nickel/Chrome are regulated under PSES starndards for Electroplating under 40 CFR 433.24(b).
These wastestreams total 14,940 gallons per day.
Alkaline Barrel Zinc 5,000 gpd, Alkaline Rack Zinc 3,600 gpd, Phosphate 300 gpd, Passivate 700 gpd, Rack Silver Line 1,200 gpd, Barrel Nickel 1,600 gpd
Alodine 800 gpd, Selective Tin 300 gpd and Copper/Nickel/Chrome 1,440 gpd = 14,940 gpd

Total Influent to Pretreatment System = 21,140 gpd

Metal Finishing Regulated Flow = 6,200 gpd	(1600+600+3,000+1,000) = 6,200
Electroplating Regulated Flow = 14,940 gpd	(5,000+3,600+300+700+1,200+1,600+800+300+1,440) = 14,940
Unregulated Flow = 0 gpd	
Dilution = 0 gpd	

(Metal Finishing Standard x 6,200 gpd) + (Electroplating Standard x 14,940 gpd) / 21,140 x (21,140 - 0)/ 21,140 gpd
Cadmium = (0.11 x 6,200) + (1.2 x 14,940) / 21,140 x 1 = 0.88 mg/l daily maximum
Total Chromium (2.77 x 6,200) + (7.0 x 14,940) / 21,140 x 1 = 5.76 mg/l daily maximum
Copper = (3.38 x 6,200) + (4.5 x 14,940) / 21,140 x 1 = 4.17 mg/l daily maximum
Lead = (0.69 x 6,200) + (0.6 x 14,940) / 21,140 x1 = 0.626, rounded 0.63 mg/l daily maximum
Nickel = (3.98 x 6,200) + (4.1 x 14,940) / 21,140 x 1 = 4.06 , rounded 4.1 mg/l daily maximum
Zinc = ((2.61 x 6,200) + (4.2 x 14,940) / 21,140 x 1 = 3.73 mg/l daily maximum

For Silver daily maximum

Metal Finishing regulated flow = 6,200 gpd	(1600 + 600 + 3,000 + 1,000) = 6,200 gpd	Total metal finishing flows
Electroplating regulated flow = 2,640 gpd	(1,200 + 1,440) = 2,640 gpd	Electroplating flows with Silver
Unregulated flow = 12,300 gpd	(21,140 - 6,200 - 2,640) = 12,300 gpd	Influent minus Metal Finishing reg. minus Electroplating reg.
Dilution = 0 gpd		
Total regulated flow = 8,840 gpd	(6,200+2,640)=8,840 gpd	

Metal Finishing silver limit x 6,200 gpd + precious metals electroplating silver limit x 2,640 gpd / total regulated flow x total flow - dilution flow / total flow
(0.43 x 6,200) + (1.2 x 2,640) / 8,840 x (21,140 - 0 / 21,140) = 0.659 = 0.66 mg/l daily maximum

For Cyanide daily maximum

Metal Finishing regulated flow = 2,640 gpd	(1,200 + 1,440) = 2,640 gpd	Electroplating with cyanide
Electroplating regulated flow = 14,940 gpd	(21,140 - 6,200) = 14,940 gpd	Influent minus Metal Finishing total flows
Unregulated flow = 0 gpd		
Dilution = 2,600 gpd	(1,600 + 1,000) = 2,600 gpd	Metal Finishing without cyanide

Metal Finishing cyanide limit x metal finishing regulated flow) + (Electroplating cyanide limit x Electroplating regulated flow)/total regulated flow X
(total flow - dilution flow)/dilution flow
(1.2 x 2,640) + (1.9 x 14,940) /17,580 x (21,140 - 2,600)/21,140 = 1.57 mg/l

For Cyanide Monthly Average

Metal Finishing regulated flow = 2,640 gpd	(1,200+1,440)	Electroplating with cyanide
Electroplating regulated flow = 14,940	(21,140 -6,200)	Influent minus Metal Finishing total flows
Unregulated Flow = 0 gpd		
Dilution = 2,600 gpd	(1,600 + 1,000)	Metal Finishing without cyanide

(Monthly average metal finishing limit) x metal finishing regulated flow) + (adjusted average electroplating limit x Electroplating flow)/
(electroplating regulated flow x (total flow - dilution flow) / Total Flow
(0.65 x 2,640) + (0.55 x 14,940)/ 17,580 x 21,140 - 2,600) / 21,140 gpd = 0.496 rounded 0.50 mg/l

For Silver Monthly Average

Metal Finishing regulated flow = 6,200 gpd	(1600 + 600 + 3,000 + 1,000) = 6,200 gpd	Total metal finishing flows
Electroplating regulated flow = 2,640 gpd	(1,200 + 1,440) = 2,640 gpd	Electroplating flows with Silver
Unregulated flow = 12,300 gpd	(21,140 - 6,200 - 2,640) = 12,300 gpd	Influent minus Metal Finishing reg. minus Electroplating reg.
Dilution = 0 gpd		
	(6,200+2,640)=8,840 gpd	Total regulated flow

(Monthly average metal finishing limit x Metal Finishing regulated flow) + (Adjusted average Electroplating limit x Electroplating flow)/
Total regulated flow / x (total flow - dilution flow)/total flow
(0.24 x 6,200) + (0.5 x 2,640)/ 8,840 x (21,100 - 0)/21,100 = 0.31 mg/l

Other Pollutants Monthly Average

Metal Finishing Regulated Flow = 6,200 gpd	(1600 + 600 + 3,000 + 1,000) = 6,200 gpd	Total metal finishing flows
Electroplating regulated flow = 14,940 gpd	(5,000+3,600+300+700+1,200+1,600+800+300+1,440)	Total electroplating flows
Dilution = 0 gpd		

(Metal Finishing Standard x 6,200) +(Adjusted Electroplating Standard x 14,940 /21,140 x (21,140 - 0/21,140)
Cadmium = (0.07 x 6,200) + (0.5 x 14,940) / 21,140 x 1 = 0.37 mg/l
Total Chromium = (1.71 x 6,200) + (2.5 x 14,940) / 21,140 x 1 = 2.27 mg/l
Copper = (2.07 x 6,200) + (1.8 x 14,940) / 21,140 x 1 = 1.88 mg/l
Lead = (0.43 x 6,200) + (0.3 x 14,300) / 21,140 x 1 = 0.33 mg/l
Nickel = (2.38 x 6,200) + (1.8 x 14,940) / 21,140 x 1 = 1.97 mg/l
Zinc = (1.48 x 6,200) + (1.8 x 14,940) / 21,140 x 1 = 1.71 mg/l

Limits calculated by the Combined Wastestream Formula			
	Daily Maximum mg/	Monthly Average mg/l	
Cadmium	0.88	0.37	
Chromium	5.76	2.27	
Copper	4.17	1.88	
Lead	0.63	0.33	
Nickel	4.1	1.97	
Zinc	3.73	1.71	
Cyanide	1.57	0.5	
Silver	0.66	0.31	
Total Toxic Organics	2.13	N/A	
Total Metals	10.5	5	